

What we claim is:

1. A screen holder for use with a size reduction machine wherein the size reduction machine includes an impeller associated with an impeller drive shaft and a drive mechanism to rotate impeller shaft wherein the screen holder comprises;

5 a. a first flange having a top surface, a bottom surface and an opening wherein the first flange bottom surface includes a screen pilot;

b. a second flange having a second opening; and

c. at least one support arm uniting the first flange with the second flange.

10 2. The screen holder of claim 1 wherein the screen pilot is a convex wall, a concave wall a straight wall, an angled wall, a channel, a plurality of posts or a combination thereof.

3. The screen holder of claim 1 wherein the screen pilot is non-continuous.

4. The screen holder of claim 1 wherein the screen pilot is a circular groove having a first surface and second surface wherein the first surface and the second surface intersect to define an angle of from 60 to about 120 degrees.

15 5. The screen holder of claim 1 wherein the first flange opening and second flange opening are circular.

6. The screen holder of claim 1 wherein the first opening is larger than the second opening.

20 7. A screen holder for use with a size reduction machine wherein the size reduction machine includes an impeller associated with an impeller drive shaft and a drive mechanism to rotate impeller shaft wherein the screen holder comprises;

a. a first flange having a top surface, a bottom surface and including a circular

opening wherein the first flange bottom surface includes a screen pilot that comprises a circular groove including a first surface and a second surface that together define an angle of from 80 to about 100 degrees;

b. a second flange having a second circular opening wherein the second flange circular opening is smaller in diameter than the first flange circular opening; and

c. at least one support arm uniting the first flange with the second flange.

8. An adjustable impeller for use with a size reduction machine wherein the size reduction machine includes an impeller, an impeller drive shaft, a frusto-conical screen, and a drive mechanism wherein the adjustable impeller comprises:

a. an impeller having at least one arm and a hub including central aperture wherein the central aperture includes a threaded portion; and

b. an impeller drive shaft associated with the drive mechanism and having a first end and a second end associated with the drive housing wherein the impeller drive shaft includes a threaded portion that is complementary to the impeller central aperture threaded portion.

9. The adjustable impeller of claim 8 wherein the impeller drive shaft first end includes an impeller to impeller drive shaft lock.

10. The adjustable impeller of claim 9 wherein the impeller to impeller drive shaft lock includes at least one slot located on the first end of the impeller drive shaft and at least one complementary slot located on a first end of the impeller wherein at least one impeller slot becomes aligned with at least one impeller drive shaft slot to form an aligned slot at least once per each 360° rotation of the impeller with respect to the impeller drive shaft.

11. The adjustable impeller of claim 10 wherein the alignment of the impeller slot

with the impeller drive shaft slot is visible to an operator.

12. The adjustable impeller of claim 10 including an impeller adjuster key having at least one key that is complementary to the aligned slot.

13. The adjustable impeller of claim 12 wherein the impeller adjuster key is reversibly
5 attached to the impeller drive shaft first end.

14. The adjustable impeller of claim 13 wherein the impeller adjuster key is bolted to the impeller drive shaft first end.

15. The adjustable impeller of claim 11 wherein the impeller central aperture threaded portion and the impeller drive shaft threaded portion are pitched at an angle that causes a gap between the impeller arm and the frusto-conical screen to change by an incremental and repeatable distance upon rotation of the impeller with respect to impeller drive shaft.

16. A method for setting a gap between an impeller and a frusto-conical screen of a size reduction machine where the size reduction machine includes an impeller drive shaft, and a drive mechanism wherein the gap is set by the steps comprising:

15 a. rotating the impeller which includes at least one arm attached to a hub having a central aperture that further includes a threaded portion in relation to an impeller drive shaft having a first end and a second end associated with the drive mechanism wherein the impeller drive shaft includes threads complementary to the impeller central aperture threaded portion and wherein the relative rotation causes the threaded portion of the impeller central aperture to
20 engage with the threaded portion of the impeller drive shaft;

b. continuing to thread the impeller onto the impeller drive shaft until at least one impeller arm contacts the frusto-conical screen; and

c. rotating the impeller with respect to the impeller drive shaft to cause the impeller central aperture threaded portion to disengage at least partially from the impeller drive threaded portion to form a gap between the impeller arm and the frusto-conical screen.

17. The method of claim 16 wherein the impeller drive shaft remains stationary
5 during rotation step (a).

18. The method of claim 16 wherein the impeller remains stationary during rotation step (a).

19. The method of claim 16 wherein the impeller drive shaft includes at least one slot and the impeller first end includes at least one slot that is complementary to impeller drive shaft slot and wherein an aligned slot is formed by aligning at least one impeller drive shaft slot with
10 at least one impeller slot and wherein an impeller adjuster key including at least one key complementary to the aligned slot is placed over the end of the impeller and the impeller drive shaft such that the impeller adjuster key fits into at least one aligned slot.